Modern Computational Accelerator Physics

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Bunch exercises

Assignment 3

Adjusting for finite statistics in one dimension

- (1) Download, study, and run `dist1d.py`.
- (2) Generalize `dist1d.py` to two dimensions.
  - Plot the three unique elements of the covariance matrix: C_{00}, C_{01} and C_{11} instead of the standard deviation.
  - Do not try to use a million particles

Things you will need to know:

- Create the array with, e.g., `x = numpy.random.standard_normal([num, 2])`
- To get the covariance of x from numpy use: `numpy.cov(numpy.transpose(x))`
- You will have to calculate the means one column at a time.
  - Use `x[:,0]` to get the first column.
- Use `H = numpy.linalg.cholesky(X)` to get the Cholesky decomposition.
- Use `numpy.linalg.inv` to calculate the matrix inverse.